

Dashboards project

Richard White

2018-11-13

Contents

Preface	2
1 Introduction	2
1.1 Executive summary	2
1.2 What is an automated analysis?	2
1.3 Why not have one project for each automated analysis?	2
1.4 Important repositories	3
2 Integrating the R package into the physical system	3
2.1 Summary	3
2.2 RunProcess.R	4
2.3 0_run.sh	5
2.4 RunTest.R	5
3 R packages	5
3.1 Summary	5
3.2 Requirements	6
3.3 Deployment via travis-ci and drat	6
4 Umbrella Infrastructure	6
4.1 Executive summary	6
4.2 What is an automated analysis?	7
4.3 Why not have one project for each automated analysis?	7
5 Contributing	7
5.1 Development guidelines	7
5.2 Code style	12
6 Documentation	12
6.1 Sykdomspulsen Weekly update	12

List of Tables

List of Figures

Preface

The dashboards project is a project at FHI concerned with running automated analyses on data. An automated analysis is any analysis that:

1. Will be repeated multiple times in the future
2. Always has an input dataset with consistent file structure
3. Always has the same expected output (e.g. tables, graphs, reports)

1 Introduction

1.1 Executive summary

The dashboards project is a project at FHI concerned with running automated analyses on data.

In principle, the dashboards project is split up into three parts:

1. The umbrella infrastructure (i.e. Docker containers, continuous integration, cron jobs, etc.)
2. The R package for each automated analysis
3. Integrating the R package into the physical system (e.g. specifying where the data is)

1.2 What is an automated analysis?

An automated analysis is any analysis that:

1. Will be repeated multiple times in the future
2. Always has an input dataset with consistent file structure
3. Always has the same expected output (e.g. tables, graphs, reports)

1.3 Why not have one project for each automated analysis?

Automated analyses have a lot of code and infrastructure in common.

Automated analyses:

1. Need their code to be tested via unit testing to ensure the results are correct
2. Need their code to be tested via integration testing to ensure everything runs
3. Need to be run at certain times
4. Need to be able to send emails notifying people that the analyses have finished running
5. Need to make their results accessible to the relevant people

By combining them all in one umbrella project we can force everyone to use the same infrastructure and coding principles, so we:

1. Only need to solve a problem once
2. Only need to maintain one system
3. Can easily work on multiple projects, as we all speak the same language

1.4 Important repositories

1.4.1 Infrastructure

https://github.com/raubreywhite/dashboards_control/ (private)

This contains the Docker files, cronfiles, all bash scripts, etc.

<https://folkehelseinstituttet.github.io/dashboards/> (this one)

This contains the R executable for each automated analysis.

<https://folkehelseinstituttet.github.io/fhi/>

This is an R package that contains helper functions.

1.4.2 Automated analyses R packages

https://folkehelseinstituttet.github.io/dashboards_sykdomspuls/

https://folkehelseinstituttet.github.io/dashboards_normomo/

https://folkehelseinstituttet.github.io/dashboards_sykdomspuls_pdf/

https://folkehelseinstituttet.github.io/dashboards_sykdomspuls_log/

2 Integrating the R package into the physical system

2.1 Summary

An R package is not enough to run an analysis – something needs to physically call the functions inside the R package. That is, the R package needs to be integrated into the physical system.

Everything related to integrating the R package into the physical system lives in the [dashboards](#) repository.

Inside the [dashboards](#) repository we have:

```
- dev/
  |-- src/
    |-- sykdomspuls/
      |-- 0_run.sh
      |-- RunProcess.R
      |-- RunTest.R
    |-- normomo/
      |-- 0_run.sh
      |-- RunProcess.R
      |-- RunTest.R
    |-- sykdomspuls_log/
      |-- 0_run.sh
```

```

|-- RunProcess.R
|-- RunTest.R
|-- sykdomspuls_pdf/
|-- 0_run.sh
|-- RunProcess.R
|-- RunTest.R

```

2.2 RunProcess.R

2.2.1 Aim

An automated analysis needs to:

1. Know the location of the data/results folders.
2. Check for new data in these folders. If no new data - then quit.
3. Load in the data.
4. Load in the analysis functions.
5. Run the analyses.
6. Save the results.

`RunProcess.R` is responsible for these tasks.

We can think of it as an extremely short and extremely high-level script that implements the analysis scripts.

Depending on the automated analysis `RunProcess.R` can be run every two minutes (constantly checking for new data), or once a week (when we know that data will only be available on a certain day/time).

2.2.2 Bounded context

1. Only one instance of `RunProcess.R` can be run at a time.
2. Data only exists on physical folders on the system.
3. The following folder structure exists on the system (here the name of the automated analysis is `ANALYSIS`):

```

/data_raw/
|-- ANALYSIS/
/data_clean/
|-- ANALYSIS/
/data_app/
|-- ANALYSIS/
/results/
|-- ANALYSIS/
/src/
|-- ANALYSIS/
|-- 0_run.sh
|-- RunProcess.R

```

|-- RunTest.R

Point #1 is important because if `RunProcess.R` is run every 2 minutes (constantly checking for new data) but the analyses take 3 hours to run, then we need to ensure that only one instance of `RunProcess.R` can be run at a time.

Point #2 is important because sometimes:

1. Data files need to be downloaded from external SFTP servers ([normomo](#), [sykdomspul-slog](#)).
2. Results files need to be uploaded to external SFTP servers ([sykdomspuls](#)).

If we include code to download/upload the files from SFTP servers inside `RunProcess.R` then it makes it very difficult to test `RunProcess.R` (because we will then need to simulate SFTP servers inside our testing infrastructure). If we know that `RunProcess.R` only accesses files that are available on physical folders in the system, then our testing infrastructure is a lot easier to create and maintain.

2.3 0_run.sh

2.3.1 Aim

The aim of `0_run.sh` is to ensure that:

1. Points 1 and 2 of the bounded context of `RunProcess.R` happen
2. Run `RunProcess.R`

With regards to the bounded context, we ensure that only one instance of `RunProcess.R` is run at a time through the use of `flock`.

(If necessary) with regards to the bounded context, we use `sshpass`, `sftp`, and `ncftpput` to download/upload files from SFTP servers.

We then run `RunProcess.R` with a standard call:

```
/usr/local/bin/Rscript /src/ANALYSIS/RunProcess.R
```

2.4 RunTest.R

2.4.1 Aim

The aim of `RunTest.R` is to perform integration testing on the automated analysis. This integration testing is performed as part of the Jenkins build pipeline.

3 R packages

3.1 Summary

Each automated analysis has its own R package:

- [sykdomspuls](#)
- [normomo](#)
- [sykdomspulspdf](#)
- [sykdomspulslog](#)

Each R package contains all of the code necessary for that automated analysis. Typical examples are:

- Data cleaning
- Signal analysis
- Graph generation
- Report generation

3.2 Requirements

The R packages should be developed using unit testing as implemented in the [testthat](#) package.

Furthermore, the R package should operate (and be able to be tested) independently from the real datasets on the system. This is because the real datasets cannot be shared publically or uploaded to github. To circumvent this issue, each package will need to develop functions that can generate fake data. [GenFakeDataRaw](#) is one example from [sykdomspuls](#).

We also require that unit tests are created to test the formatting/structure of results. [ValidateAnalysisResults](#) is one example from [sykdomspuls](#), where the names of the data.table are checked against reference values to ensure that the structure of the results are not accidentally changed.

3.3 Deployment via travis-ci and drat

Unit testing is then automatically run using [travis-ci](#). If the R package passes all tests, then we use [drat](#) to deploy a built version of the package to Folkehelseinstituttet's R repository: <https://folkehelseinstituttet.github.io/drat/>.

4 Umbrella Infrastructure

- Three computers

4.1 Executive summary

The dashboards project is a project at FHI concerned with running automated analyses on data.

In principle, the dashboards project is split up into three parts:

1. The overarching infrastructure (i.e. Docker containers, continuous integration, cron jobs, etc.)

2. The R package for each automated analysis
3. The executable for each automated analysis

4.2 What is an automated analysis?

An automated analysis is any analysis that:

1. Will be repeated multiple times in the future
2. Always has an input dataset with consistent file structure
3. Always has the same expected output (e.g. tables, graphs, reports)

4.3 Why not have one project for each automated analysis?

Automated analyses have a lot of code and infrastructure in common.

Automated analyses:

1. Need their code to be tested via unit testing to ensure the results are correct
2. Need their code to be tested via integration testing to ensure everything runs
3. Need to be run at certain times
4. Need to be able to send emails notifying people that the analyses have finished running
5. Need to make their results accessible to the relevant people

By combining them all in one umbrella project we can force everyone to use the same infrastructure, so we:

1. Only need to solve a problem once
2. Only need to maintain one system
3. Can easily work on multiple projects, as we all speak the same language

5 Contributing

5.1 Development guidelines

We try to follow the [GitHub flow](#) for development.

1. Fork [this repo][repo] and clone it to your computer. To learn more about this process, see [this guide](#).

2. Add the Folkehelseinstituttet repository as your upstream:

```
git remote add upstream https://github.com/folkehelseinstituttet/ORIGINAL_REPOSITORY
```

3. If you have forked and cloned the project before and it has been a while since you worked on it, merge changes from the original repo to your clone by using:

```
git fetch upstream
git merge upstream/master
```

4. Open the RStudio project file (.Rproj).

5. Make your changes:
 - Write your code.
 - Test your code (bonus points for adding unit tests).
 - Document your code (see function documentation above).
 - Do an R CMD check using `devtools::check()` and aim for 0 errors and warnings.
 - Commit your changes locally
 - Merge changes from the original repo (again)
 - Do an R CMD check using `devtools::check()` and aim for 0 errors and warnings.
6. Commit and push your changes.
7. Submit a [pull request](#).
8. If you are reviewing the pull request, wait until the [travis-ci](#) unit tests have finished

GitHub, Inc. github.com/folkehelseinstituttet/fhi/pull/22

Search or jump to... Pull requests Issues Marketplace Explore

folkehelseinstituttet / fhi Unwatch 5 Star 0

Code Issues 0 Pull requests 1 Projects 0 Wiki Insights Settings

Updating vignette #22

Open raubreywhite wants to merge 1 commit into folkehelseinstituttet:master from raubreywhite:master

Conversation 0 Commits 1 Checks 0 Files changed 2

raubreywhite commented just now Member + ...

No description provided.

Updating vignette f3897a3

Add more commits by pushing to the **master** branch on **raubreywhite/fhi**.

This branch has not been deployed
No deployments

Some checks haven't completed yet Hide all checks
1 pending check

- continuous-integration/travis-ci/pr Pending — The Travis CI build is in progr... Details

This branch has no conflicts with the base branch
Merging can be performed automatically.

Merge pull request You can also open this in GitHub Desktop or view command line instructions.

Write Preview AA B i “ < > ↻ ⋮ ≡ ⌵ @ 📌 ↶

Leave a comment

Attach files by dragging & dropping, selecting them, or pasting from the clipboard.

Styling with Markdown is supported

Close pull request Comment

Reviewers
No reviews

Assignees
No one—assign y

Labels
None yet

Projects
None yet

Milestone
No milestone

Notifications
You're receiving n because you auth

1 participant

Lock conversa

Allow edits fro Learn more

9. Please make sure that the unit tests **PASS** before merging in!!

GitHub, Inc. github.com/folkehelseinstituttet/fhi/pull/22

Search or jump to... Pull requests Issues Marketplace Explore

folkehelseinstituttet / fhi Unwatch 5 Star 0

Code Issues 0 Pull requests 1 Projects 0 Wiki Insights Settings

Updating vignette #22

Open raubreywhite wants to merge 1 commit into folkehelseinstituttet:master from raubreywhite:master

Conversation 0 Commits 1 Checks 0 Files changed 2

raubreywhite commented 7 minutes ago Member + @ @ ...

No description provided.

Updating vignette f3897a3

Add more

THIS IS BAD!!!!

All checks have failed Hide all checks
1 errored check

continuous-integration/travis-ci/pr — The Travis CI build could not complete ... Details

This branch has no conflicts with the base branch
Merging can be performed automatically.

Merge pull request You can also open this in GitHub Desktop or view command line instructions.

THIS IS BAD!!!!

Attach files by dragging & dropping, selecting them, or pasting from the clipboard.

Styling with Markdown is supported Close pull request Comment

Reviewers: No reviews

Assignees: No one—assign yourself

Labels: None yet

Projects: None yet

Milestone: No milestone

Notifications: You're receiving notifications because you are a participant

1 participant

Lock conversation

Allow edits from maintainers Learn more

5.2 Code style

- Function names start with capital letters
- Variable names start with small letters
- Environments should be in ALL CAPS
- Reference [Hadley's style code](#)
- <- is preferred over = for assignment
- Indentation is with two spaces, not two or a tab. There should be no tabs in code files.
- if () {} else {} constructions should always use full curly braces even when usage seems unnecessary from a clarity perspective.
- TODO statements should be opened as GitHub issues with links to specific code files and code lines, rather than written inline.
- Follow Hadley's suggestion for aligning long functions with many arguments:

```
long_function_name <- function(a = "a long argument",  
                                b = "another argument",  
                                c = "another long argument") {  
  # As usual code is indented by two spaces.  
}
```

- Never use print() to send text to the console. Instead use message(), warning(), and error() as appropriate.
- Use environment variables, not options(), to store global arguments that are used by many or all functions.

6 Documentation

6.1 Sykdomspulsen Weekly update

The weekly update needs to be done every Tuesday morning. New data has arrived from Helsedirektoratet to FHI during Monday evening and night, and the further statistical analysis and updating of the interactive webpage for Sykdomspulsen is done on Tuesday. For more information about Sykdomspulsen setup:

<https://folkehelseinstituttet.github.io/dashboards/>

https://folkehelseinstituttet.github.io/dashboards_sykdomspuls/

1. Log in to «Sikker sone»
2. Click on «Sikkersone statistikk»
3. Open R or R studio by clicking on the four squares in the bottom left corner, then on the arrow pointing downwards approximately in the same area and search for R in the upper right corner

4. When R is open, click on “file” in the upper left corner, and then “open script”
5. Open G:/Helseregistre/MSIS/Sykdomspulsen/Gry/FormattingWithinSikkersone/SykdomspulsenWeeklyReport
6. Slide the R-code so that it is beside the R console (so that you can see the whole R console)
7. Put the marker within the R-code and click Ctrl+A, then click Ctrl+R
8. After a few minutes, you will see a progress bar on the R-console, which shows how much of the code is finished. When the bar shows 100%, the whole code has run, and the results are finished (this takes about 1 hour, you can do other things while waiting for this)
9. When the progress bar shows 100% you should look at the data that is shown in the console and see if the dates are from this week. If not you should contact the IT department by Cathrine Slorbak (Cathrine.Slorbak@fhi.no) and Gry Grøneng (GryMarysol.Groneng@fhi.no). There is probably something wrong with receiving the data from the Health directorate, hence the IT department needs to solve it. Do not continue until the problem is solved.
10. If the dates look ok, you can close R (by clicking on x in the upper right corner).
11. Go to “Windows explorer” by clicking on the four squares in the lower left corner (still in “sikker sone”), and go to: G:/Helseregistre/MSIS/Sykdomspulsen/Gry/FormattingWithinSikkersone, and find a text file which is called “partially_formatted_todays date.txt” (todays date is displayed 2017_06_13). You should look if the file is larger than last weeks file, it should be larger since we take out all the data every week, and more days have been added since last week. If the file is smaller than last week, contact the IT department by Cathrine Slorbak (Cathrine.Slorbak@fhi.no) and Gry Grøneng (GryMarysol.Groneng@fhi.no). Do not continue until the problem is solved.
12. Copy and paste the file into the folder “Filer til ordinær sone (J:)”
13. Log out of “sikker sone” and open the windows explorer in the ordinary zone and go to “Filer overført fra sikker sone (K:)” and find the file.
14. Copy and paste the file into:
 - F:/Prosjekter/sMSIS/WeeklyUpdates_Sykdomspulsen AND
 - F:/Prosjekter/Dashboards/data_raw/sykdomspuls
15. You have now done the weekly update of Sykdomspulsen!